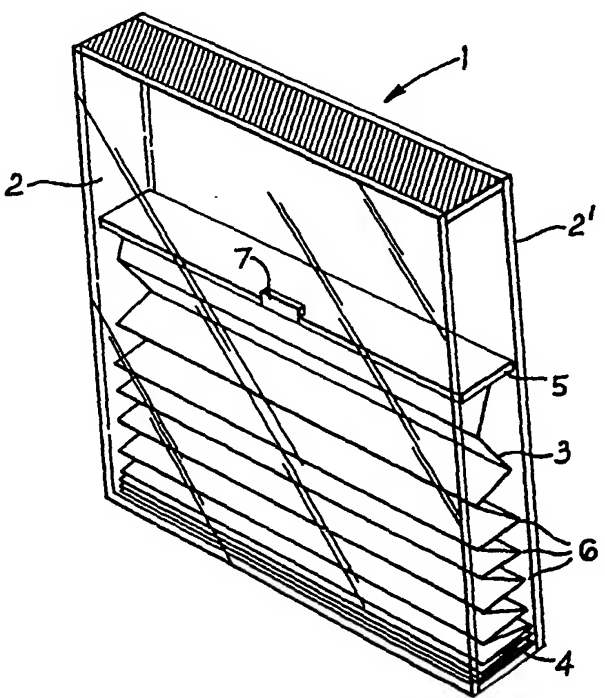


**PCT**WORLD INTELLECTUAL PROPERTY ORGANIZATION  
International Bureau

## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<b>(51) International Patent Classification <sup>5</sup> :</b>  <b>E06B 9/264</b>	<b>A1</b>	<b>(11) International Publication Number:</b> <b>WO 90/15914</b>  <b>(43) International Publication Date:</b> 27 December 1990 (27.12.90)
<b>(21) International Application Number:</b> PCT/GB90/00954 <b>(22) International Filing Date:</b> 21 June 1990 (21.06.90)  <b>(30) Priority data:</b> 8914286.3                      22 June 1989 (22.06.89)                      GB  <b>(71)(72) Applicant and Inventor:</b> MUSTAFA, Nihad, Majid [GB/GB]; Paddock Wray, Chapel Hill, Lt Addington, Kettering, Northants NN14 4BG (GB).  <b>(74) Agent:</b> GILDING, Martin; Eric Potter & Clarkson, St Mary's Court, St Mary's Gate, Nottingham NG1 1LE (GB).		<b>(81) Designated States:</b> AT, AT (European patent), AU, BB, BE (European patent), BF (OAPI patent), BG, BJ (OAPI patent), BR, CA, CF (OAPI patent), CG (OAPI patent), CH, CH (European patent), CM (OAPI patent), DE*, DE (European patent)*, DK, DK (European patent), ES, ES (European patent), FI, FR (European patent), GA (OAPI patent), GB, GB (European patent), HU, IT (European patent), JP, KP, KR, LK, LU, LU (European patent), MC, MG, ML (OAPI patent), MR (OAPI patent), MW, NL, NL (European patent), NO, RO, SD, SE, SE (European patent), SN (OAPI patent), SU, TD (OAPI patent), TG (OAPI patent), US.  <b>Published</b> <i>With international search report.</i>
<b>(54) Title:</b> DOUBLE GLAZED UNIT  <b>(57) Abstract</b> <p>A double glazed unit (1) is provided with a pleated blind member (3) in the space between the two panels (2, 2') of the unit. One end of the blind member (3) is provided with a magnet (7) and a moveable magnet (8) is provided on an exterior face of a panel (2) of the unit (1) adjacent the magnet (7) on the blind. Moving the magnet (8), by attracting the magnet (7), draws the blind member (3) with it and either folds or unfolds the pleats (6) thus opening or closing the blind member (3).</p> 		

### DESIGNATIONS OF "DE"

Until further notice, any designation of "DE" in any international application whose international filing date is prior to October 3, 1990, shall have effect in the territory of the Federal Republic of Germany with the exception of the territory of the former German Democratic Republic.

#### FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AT	Austria	ES	Spain	MC	Monaco
AU	Australia	FI	Finland	MG	Madagascar
BB	Barbados	FR	France	ML	Mali
BE	Belgium	GA	Gabon	MR	Mauritania
BF	Burkina Faso	GB	United Kingdom	MW	Malawi
BG	Bulgaria	GR	Greece	NL	Netherlands
BJ	Benin	HU	Hungary	NO	Norway
BR	Brazil	IT	Italy	RO	Romania
CA	Canada	JP	Japan	SD	Sudan
CF	Central African Republic	KP	Democratic People's Republic of Korea	SE	Sweden
CG	Congo	KR	Republic of Korea	SN	Senegal
CH	Switzerland	LI	Liechtenstein	SU	Soviet Union
CM	Cameroon	LK	Sri Lanka	TD	Chad
DE	Germany, Federal Republic of	LU	Luxembourg	TC	Togo
DK	Denmark			US	United States of America

DOUBLE GLAZED UNIT

This invention relates to a double glazed unit and more particularly to a double glazed unit provided with a blind member in the space between the two panels of the double glazed unit.

Double glazed units of numerous types are well known, predominantly as energy saving and/or noise reducing devices. Window blinds are likewise widely used, frequently complementarily to curtains, where they provide a simple means of covering the window area completely, whilst, unlike curtains, being able to be withdrawn more or less completely to an inconspicuous position when not in use.

Blind materials are relatively expensive, both because of the cost of the material used for them, which has to withstand considerable handling, also the operating mechanisms involved. They are also difficult to clean, readily becoming dirty and dusty.

The present invention provides a double glazed unit which seeks to overcome the problems encountered with known blinds.

The invention provides a double glazed unit comprising two panels with a space therebetween, the double glazed unit being provided with a blind member in the space between the panels, the blind member being extendable and retractable between a first blind open position and a second blind closed position, and moving means to extend and retract the blind between the first and second positions. The term "panels" is used herein to include panels made from any suitable transparent or translucent material. The "blind closed position" is that where the blind is extended across substantially the whole of the panels and the "blind open position" is that where the blind is retracted so that it covers only a small part of the panels.

Preferably, the moving means comprises a movable magnet on the exterior of a panel of the double glazed unit and at least one magnet provided on an end of the blind member. The movable magnet is conveniently provided on the panel which is on the room interior or working side of the double glazed unit and the magnet provided on the end of the blind is adjacent the panel provided with the movable magnet.

The end of the blind member opposite that provided with a magnet is fixed to the double glazed unit.

Conveniently, the blind member is folded a plurality of times to form pleats, such that the blind member can extend and retract in a concertina-like manner.

Each end of the blind member is provided with an end member. One end member is fixed to the double glazed unit and the opposite end member is provided with at least one magnet. The provision of an end member provides some reinforcement along each end of the blind member to aid movement of the blind member and prevent the sides of the blind member curling towards each other.

The blind member and the end member provided with a magnet may be adapted to receive at least one guide line. Conveniently, two guide lines may be provided, each being adjacent and parallel to opposite sides of the double glazing unit and extending between the other opposite sides of the double glazing unit. The edge of each pleat of the blind member is provided with a notch and each end of the end member is provided with a hole to receive the guide line.

The blind member is made from any suitable lightweight, opaque material.

A preferred embodiment of the invention will now be described in detail with reference to the accompanying drawings in which:-

Figure 1 is a perspective view of a double glazing unit according to the invention;

Figure 2 is a front view of a unit showing the blind member fully retracted;

Figure 3 shows the blind member of Figure 2 in a partly extended position; and

Figure 4 shows a side view of the double glazed unit in section showing the moveable magnet in position for use.

Referring first to Figure 1, a double glazed unit 1 comprises two substantially parallel panels 2, 2' with a space between them. A blind member 3 is situated between the panels 2, 2'. At each end of the blind member 3 is an end member 4, 5, in the form of a batten which extends

for substantially the width of the space between the panels 2,2', leaving sufficient space for example about 1 mm between each edge of the batten 5 and the panel 2,2' to allow the batten 5 to move freely in the space between the panels 2,2' without touching the panels 2,2'. The batten 4 is fixed to the bottom of the unit 1.

The blind member 3 is folded a plurality of times across its width to form a number of pleats 6, which allows the blind member 3 to extend and retract in a concertina-like manner. The folds are spaced so that when the blind member 3 is retracted to the blind open position, the pleats 6 substantially fill the space between the panels 2,2' leaving just sufficient space for example about 1 mm between each edge of the pleat 6 and the panel 2,2' for movement of the blind member 3 without contacting the panels 2,2'.

The batten 5 is provided with one or more magnets 7 adjacent the panel 2 which faces the room interior or working side of the double glazed unit 1. A moveable magnet 8 (shown in Figure 4) in a holder 9 is provided on the other side of the panel 2 adjacent the magnet 7, the magnets 7 and 8 attracting each other.

The panels 2,2' are made from any suitable transparent or translucent material such as glass or plastic, preferably glass. The blind member 3 is made from any suitable lightweight, opaque material which is thin but sufficiently rigid and will fold and unfold as required. Paper is preferable. The battens 4, 5 may be made from any suitable lightweight material such as wood or plastic.

The blind member is operated by moving the magnet 8. Moving the magnet 8 upwards, draws the batten 5 upwards with it, due to the attraction between the magnets 7, 8, which in turn extends the blind member 3, unfolding the pleats 6. When the magnet 8 reaches the top of the double glazed unit 1 the blind member 3 will be fully extended ie. in the blind closed position. In this position, the pleats 6 are not fully unfolded, each side of the pleat 6 being at an angle of approximately  $10^{\circ}$  to the vertical, to ensure that correct folding of the pleats 6 occurs when the blind member 3 is retracted.

The blind is opened by moving the magnet 8 downwards, drawing the batten 5 with it which in turn retracts the blind member 3 folding the pleats 6 together and taking the blind member 3 to the blind open position.



The blind open position is shown in Figure 2 and a position intermediate the open and closed position is shown in Figure 3.

It has been found that there is sufficient frictional force between the magnets 7, 8 and the panel 2 to hold the blind member 3 in any desired position without the necessity for any other retaining means.

In an alternative embodiment of the invention, two guide lines are provided which extend between the top and bottom of the double glazed unit 1, one on each side of the unit. Each pleat 6 is provided with a V-shaped notch at each end to receive the guide line. The batten 5 is provided with a hole at each end through which the guide line may pass. The guide lines act as a restraint as the blind member 3 is extended and retracted to prevent the blind member toppling sideways or "jack-knifing" as one side folds or unfolds faster than the other.

As an alternative to the pleated blind member 3, any other suitable arrangement may be used, for example the blind member 3 may be rolled.

The batten 4 may alternatively be fixed to the top of the double glazed unit 1 and the magnet 8 moved downwards to close the blind and upwards to open the blind. The batten 4 may also be fixed to either side of the double glazed unit with the blind member 3 being drawn horizontally across the panels 2,2'.

Several blind members 3, each with their own magnets 7, 8, may be situated side by side, for example in a long double glazed unit. This avoids having a very wide blind member 3 which may be more difficult to handle and can also be done to allow individual adjustment at different parts of the window.

A suitable mechanical arrangement such as a pulley arrangement may be used to move the magnet 8 rather than moving it by hand. This would be especially useful for high windows. The mechanical arrangement itself may be hand operated as in conventional venetian style blinds, or operated by any indirect means such as electro-mechanical means.

In situations where a high degree of light exclusion is required, sometimes in both directions, for example in dark rooms, lecture rooms or projection auditoria, strips

of the opaque material used to make the blind member 3 can be permanently attached along all four sides of both panels which overlap the edges of the blind member when closed and prevent light from entering or leaving via the slight gap at the edges of the blind member.

The double glazing unit of the present invention provides a blind system which requires no handling of the blind member itself. The blind member can therefore be constructed of much lighter, and therefore much cheaper, material than conventional blinds. The blind member is completely enclosed and is therefore protected from dust and other contamination and requires no cleaning.

CLAIMS.

1. A double glazed unit 1, characterised in that it comprises two panels 2,2' with a space therebetween, the double glazed unit 1 being provided with a blind member 3 in the space between the panels 2,2', the blind member 3 being extendable and retractable between a first blind open position and a second blind closed position, and moving means to extend and retract the blind between the first and second positions.

2. A double glazed unit 1 according to claim 1 wherein the moving means comprises a moveable magnet 8 on the exterior of a panel 2 of the double glazed unit 1 and at least one magnet 7 provided on an end of the blind member 3.

3. A double glazed unit 1 according to claim 2 wherein the end of the blind member 3 opposite the end provided with a magnet 7 is fixed to the double glazed unit 1.

4. A double glazed unit 1 according to any one of claims 1 to 3 wherein the blind member 3 is folded a plurality of times to form pleats 6, such that the blind member can extend and retract in a concertina-like manner.

5. A double glazed unit 1 according to any one of the preceding claims wherein each end of the blind member 3 is provided with an end member 4, 5.

6. A double glazed unit 1 according to claim 5 wherein one end member 4 is fixed to the double glazed unit 1 and the opposite end member 5 is provided with at least one magnet 7.

7. A double glazed unit 1 according to any one of the preceding claims wherein the blind member 3 is adapted to receive at least one guide line.

8. A double glazed unit 1 according to claim 6 wherein the end member 5 provided with a magnet 7 is adapted to receive at least one guide line.

9. A double glazed unit 1 according to any one of the preceding claims wherein the blind member 3 is made from a lightweight opaque material.

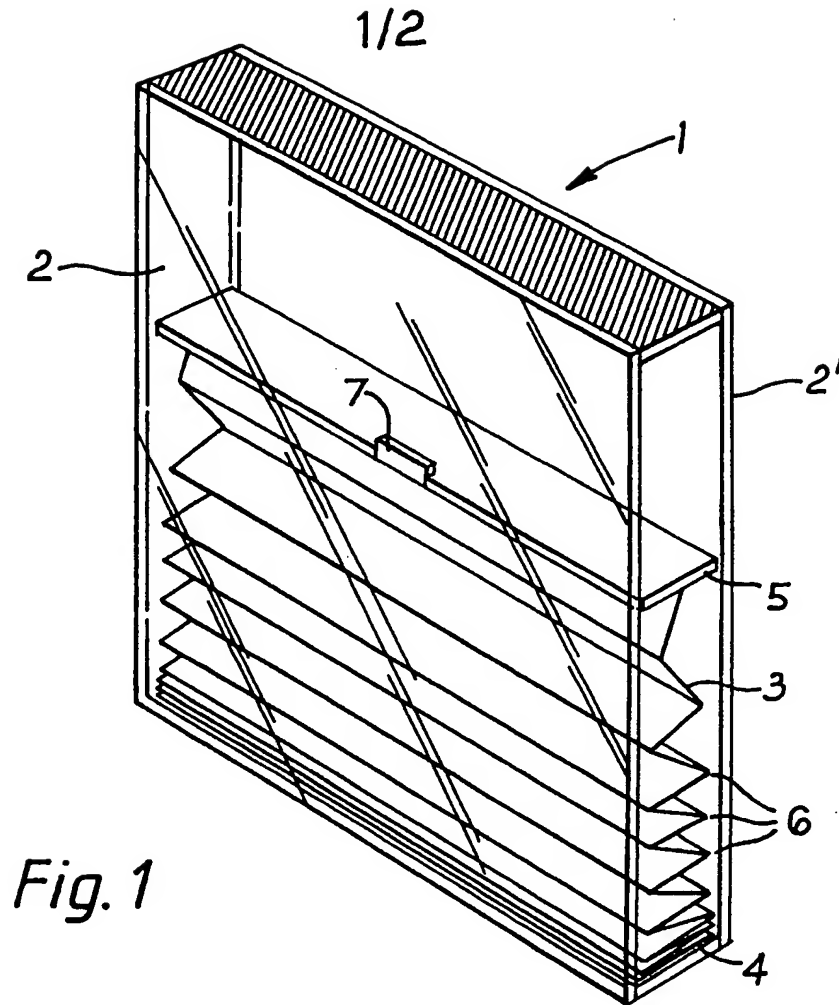


Fig. 1

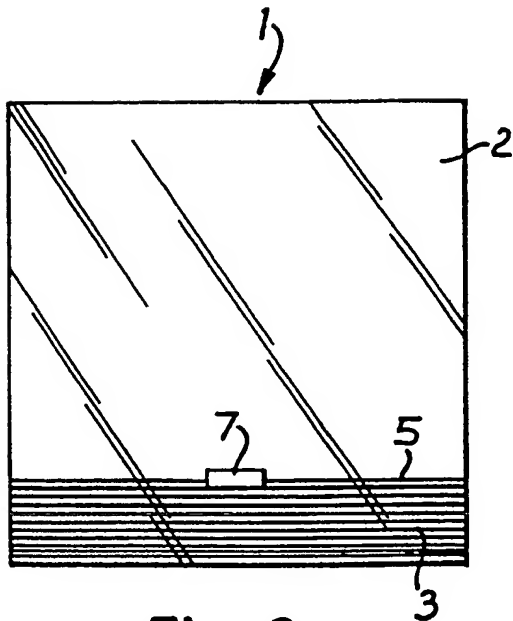


Fig. 2

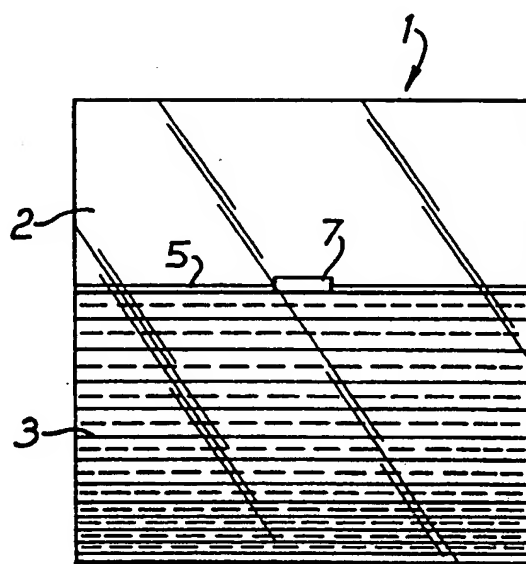


Fig. 3

2/2

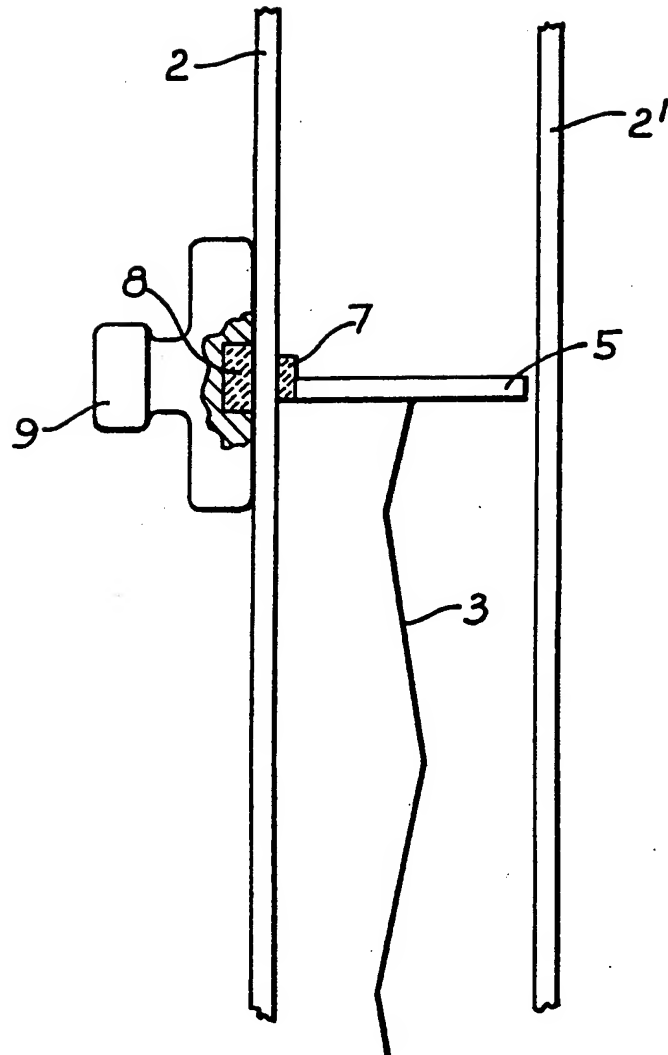


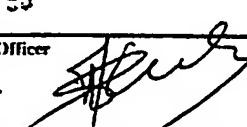
Fig. 4



## INTERNATIONAL SEARCH REPORT

PCT/GB 90/00954

International Application No

<b>I. CLASSIFICATION OF SUBJECT MATTER</b> (If several classification symbols apply, indicate all) <sup>6</sup>		
According to International Patent Classification (IPC) or to both National Classification and IPC		
Int.Cl. 5 E06B9/264		
<b>II. FIELDS SEARCHED</b>		
Minimum Documentation Searched <sup>7</sup>		
Classification System	Classification Symbols	
Int.Cl. 5	E06B	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched <sup>8</sup>		
<b>III. DOCUMENTS CONSIDERED TO BE RELEVANT<sup>9</sup></b>		
Category <sup>10</sup>	Citation of Document, <sup>11</sup> with indication, where appropriate, of the relevant passages <sup>12</sup>	Relevant to Claim No. <sup>13</sup>
X	EP,A,72062 (NARDINI) 16 February 1983 see pages 6 - 7; figures 1, 3 ---	1-9
X	GB,A,1063707 (KAZUO GOTOH) 30 March 1967 see page 1, line 61 - page 2, line 40; figures 1, 2 ---	1-9
X	FR,A,1405364 (MIROITERIE DE LUTECE) 31 May 1965 see the whole document ---	1-9
<p><sup>10</sup> Special categories of cited documents:</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"F" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"A" document member of the same patent family</p>		
<b>IV. CERTIFICATION</b>		
Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report	
20 SEPTEMBER 1990	04.10.90	
International Searching Authority	Signature of Authorized Officer	
EUROPEAN PATENT OFFICE	KUKIDIS S. 	

# ANNEX TO THE INTERNATIONAL SEARCH REPORT ON INTERNATIONAL PATENT APPLICATION NO.

GB 9000954  
SA 37846

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report.  
The members are as contained in the European Patent Office EDP file on  
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

20/09/90

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP-A-72062	16-02-83	None	
GB-A-1063707		None	
FR-A-1405364		None	

EPO FORM P047

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82